REMARKS

Claims 23-24 and 26-27 have been amended. Claims 1-15 and 20-27 are pending. Applicant respectfully requests reconsideration and allowance of the application.

Claim rejections under 35 U.S.C. 112

Claims 23 and 26 stand rejected under 35 U.S.C. 112 as being infinite because the claims include the word "certain". To facilitate prosecution, claims 23 and 26 have been amended to delete that word, which does not affect the scope of the claims. Applicant respectfully requests that the claim rejections be withdrawn.

Claim rejections under 35 U.S.C. 103 (a) - He and Zisapel

Claims 1-20 and 23-27 stand rejected under 35 U.S.C. 103(a) as being unpatentable by He et al. (U. S. Patent Number 6,671,259) (hereinafter "the He reference") in view of Zisapel et al. (U. S. Patent Application Pub. No. US 2005/0022203 A1) (hereinafter "Zisapel").

Claim 1 recites:

> A system for performing client-centric load balancing of multiple globally-dispersed servers, the servers being accessed by clients connecting through an ISP having a domain name server (DNS-ISP), the servers further having an authoritative domain name server (DNS-A) associated therewith, the system comprising:
>
> a first domain name server deployed on an Internet backbone (DNS-B); and
>
> a plurality of load balancing domain name servers (DNS-LBs) deployed in close physical proximity to the clients, the DNS-LBs having stored therein IP address information of the multiple globally-dispersed servers to be load balanced, the DNS-LBs each sending mapping information to the DNS-B relating the DNS-LB's IP address to an IP address of the DNS-ISP to which the DNS-LB is

in close physical proximity, the DNS-LBs determining performance characteristics of each of the multiple globally-dispersed servers.

The system recited in claim 1 enables clients to access globally-dispersed servers while performing load balancing on the servers. Clients connect to the servers through an ISP domain name server (DNS-ISP). In particular, the system includes multiple load balancing domain name servers (DNS-LBs) deployed in close physical proximity to the clients. Also, the DNS-LBs are configured to determine performance characteristics of each of the multiple globally-dispersed servers. The He reference does not disclose or suggest such a system.

The He reference merely describes a system for wide area network load balancing. The He reference describes the use of a load balancing server (LBS) selector 15 to handle a request from client systems 11a,b. (See the He reference, Fig. 1). LBS selector 15 selects one of the load balancing (LB) servers 17a,b and sends the request to the selected LB server. The LB servers 17a,b selects from a group of servers 19a so as to balance tasks among the servers 19a. (See the He reference, col. 2, line 66 to col. 4, line 49; Fig. 1). However, the LBS selector described by the He reference simply selects a server to balance tasks among the servers, without taking physical proximity into account. Thus, the He reference fails to disclose or suggest a system with load balancing domain name servers that are deployed in close physical proximity to the clients and that are configured to determine performance characteristics of globally-dispersed servers, as recited in claim 1. Zisapel does not remedy these deficiencies.

Zisapel describes a triangulation load balancing system for load balancing client requests among redundant network servers and server farms in different geographical locations. The system described in Zisapel uses a triangulation network address to forward request from a first load balancer to a second load balancer. (See Zisapel,

paragraph 0008). It would appear that the Zisapel system enables multiple load balancers close to the servers to collectively decide which of the load balancers would be designated to handle a request from a client. (See Zisapel, paragraph 0037-0044). Unlike the system recited in claim 1, the system described by Zisapel appears to include load-balancer that are located near the content servers, instead of the clients. (See Zisapel, FIG. 2A-E). Thus, Zisapel, in fact, teaches away from the system recited in claim 1.

For at least the above-identified reasons, Applicant respectfully submits that claim 1 is patentable over the He reference and Zisapel, alone or in combination, and is allowable. Given that claims 2-9 depend from claim 1, claims 2-9 are also allowable for as least these reasons.

Claim 10 recites:

> A method of performing client-centric load balancing of multiple globally-dispersed servers, the servers being accessed by clients connecting through an ISP having a domain name server (DNS-ISP), the servers further having an authoritative domain name server (DNS-A) associated therewith, the method comprising the steps of:
>
> receiving IP address information from the DNS-A for the servers to be load balanced;
>
> providing the IP address information to a plurality of load balancing domain name servers (DNS-LB);
>
> receiving mapping information associating DNS-ISP IP address information to IP address information of a proximately located DNS-LB capable of determining server performance from a location physically proximate to the ISP's point of presence; and
>
> referring address inquiries from a DNS-ISP to a physically proximate DNS-LB in accordance with the mapping information.

The method recited in claim 10 includes the step of "receiving mapping information associating DNS-ISP IP address information to IP address information of a proximately located DNS-LB capable of determining server performance from a location physically proximate to the ISP's point of presence". Claim 10 also discloses that the clients connect to the servers through the DNS-ISP. Thus, the DNS-LB recited in claim 10 is at a location proximate to the DNS-ISP associated with the clients.

As discussed above, the He reference and Zisapel do not disclose or suggest deploying DNS-LBs in close physical proximity to the clients. The references also fail to describe deploying the DNS-LBs in close physical proximity to a DNS-ISP associated with the client. Thus, since the He reference and Zisapel do not describe the deployment and use of such a DNS-LB, the references cannot disclose or suggest receiving mapping information associating the DNS-ISP with a proximately located DNS-LB capable of determining server performance from a location physically proximate to the ISP's point of presence. Without such mapping information, the references also fail to disclose or suggest referring address inquiries from a DNS-ISP to a physically proximate DNS-LB in accordance with the mapping information, as recited in claim 10.

For at least the above-identified reasons, Applicant respectfully submits that claim 10 is patentable over the He reference and Zisapel, alone or in combination, and is allowable. Given that claim 11 depends from claim 10, claim 11 is also allowable for as least these reasons.

Claim 12 recites:

> A method of performing client-centric load balancing of multiple globally-dispersed servers, the servers being accessed by clients connecting through an ISP having a domain name server (DNS-ISP), the servers further having an authoritative domain name server (DNS-A) associated therewith, the method comprising the steps of:

obtaining, by a load balancing domain name server (DNS-LB), IP address information for a DNS-ISP located in close physical proximity to the DNS-LB;

providing a mapping of an IP address of the DNS-LB to the IP address information of the DNS-ISP to an external domain name server;

receiving IP address information for the servers;

monitoring performance of the servers at the received IP addresses; and

providing at least one IP address for a server in response to a name query selected based on the monitoring step.

As discussed above, neither the He reference nor Zisapel discloses or suggests DNS-LBs that are located in close physical proximity to a DNS-ISP associated with the clients or receiving mapping information associating a DNS-ISP with a proximately located DNS-LB. Thus, without the proximately located DNS-LB or the mapping information, the references also cannot disclose or suggest obtaining IP address information for a DNS-ISP located in close physical proximity to the DNS-LB or providing a mapping of an IP address of the DNS-LB to the IP address information of the DNS-ISP to an external domain name server, as recited in claim 12.

For at least the above-identified reasons, Applicant respectfully submits that claim 12 is patentable over the He reference and Zisapel, alone or in combination, and is allowable. Given that claims 13-15 depend from claim 12, claims 13-15 are also allowable for as least these reasons.

Claim 20 recites:

A method of performing client-centric load balancing of multiple globally-dispersed servers, the servers being accessed by clients connecting through Internet service providers (ISPs) at a point of presence (POP), each ISP having a domain name server (DNS-ISP), the servers further having an authoritative domain name server (DNS-A) associated therewith containing information regarding the IP addresses of the servers, the method comprising the steps of:

deploying a first plurality of load balancing domain name servers (DNS-LBs) in close physical proximity to the ISP POPs;

deploying a second plurality of second level domain name servers (DNS-Bs) on the Internet backbones and regional provides;

communicating IP address information for the DNS-Bs to the DNS-As to enable the DNS-As to refer name queries to the DNS-Bs;

providing, by the DNS-LBs to the DNS-B, mapping information associating an IP address of the DNS-LB to an IP address of the physically proximate DNS-ISP to enable the DNS-B to refer name queries from a DNS-ISP to the physically proximate DNS-LB; and

communicating IP address information of the servers to the DNS-LBs;

monitoring, by the DNS-LBs at a location physically proximate to the ISP POP, performance of the servers; and

providing, by the DNS-LB in response to a query from the DNS-ISP, the IP address of a server based on the step of monitoring.

As discussed above, neither the He reference nor Zisapel discloses or suggests deploying DNS-LBs located in close physical proximity to a DNS-ISP associated with the clients or receiving mapping information associating a DNS-ISP with a proximately located DNS-LB. The references also fail to disclose or suggest deploying the DNS-LBs located in close physical proximity to ISP POPs associated with the clients. Furthermore, the He reference and Zisapel also fail to disclose or suggest the step of monitoring performance of the servers by the DNS-LBs at a location physically proximate to the ISP POP, as recited in claim 20. For the above-identified reasons, Applicant respectfully submits that claim 20 is patentable over the He reference and Zisapel, alone or in combination, and is allowable.

As amended, Claim 23 recites:

A method for load balancing content servers, each of the content servers associated with a domain name, the method comprising:

receiving a request to resolve the domain name from an ISP DNS server;

identifying at least one load balancing server from a group of load balancing servers, the identified load balancing server situated at a location in physical proximity to the ISP DNS server;

sending the IP address of the identified load balancing server to the ISP DNS server, the identified load balancing server configured to determine at least one of the content servers with characteristics relative to the location and to resolve the domain name with an IP address associated with the determined content server.

As discussed above, the He reference and Zisapel do not disclose or suggest deploying load balancing servers that are located in close physical proximity to a ISP DNS. Thus, neither the He reference nor Zisapel can disclose or suggest the step of "identifying at least one load balancing server from a group of load balancing servers, the identified load balancing server situated at a location in physical proximity to the ISP DNS server". Furthermore, the references also fail to describe a load balancing server configured to determine at least one of the content servers with characteristics relative to the location. Therefore, the references also cannot disclose or suggest the step of sending the IP address of such a load balancing server to the ISP DNS server, as recited in claim 23.

For at least the above-identified reasons, Applicant respectfully submits that claim 23 is patentable over the He reference and Zisapel, alone or in combination, and is allowable. Given that claims 24-25 depend from claim 23, claims 24-25 are also allowable for as least these reasons.

As amended, Claim 26 recites:

A system for load balancing a group of content servers located at multiple sites, the group of content servers associated with a domain name, each content server configured to interact with clients through ISP DNS servers associated with the clients, the system comprising:

load balancing servers configured to resolve the domain name with an IP address associated with at least one of the content servers, each load balancing server situated at a location in physical proximity to at least one of the ISP DNS servers, each load balancing server also configured to monitor the content servers and to resolve the domain name with the IP address of at least one of the content servers with characteristics relative to the location of the load balancing server;

a referral server configured to receive requests to resolve the domain name from the ISP DNS servers, the referral server configured to respond to each request by determining at least one of the load balancing servers that is proximate to the ISP DNS server from which the request was received and referring the ISP DNS server to the determined load balancing server;

wherein requests to resolve the domain name from each ISP DNS server are responded by a load balancing server situated at a location in physical proximity to the ISP DNS server, and wherein each load balancing server responds to each request by determining at least one of the content servers that has the characteristics relative to the location and by resolving the domain name in the request with the IP address of the determined content server.

As discuss above, the He reference and Zisapel do not disclose or suggest a system that includes load balancing servers that are located in close physical proximity to ISP DNS servers. The references also fail to describe a referral server configured to respond to a request by determining at least one of the load balancing servers that is proximate to the ISP DNS server from which the request was received and referring the ISP DNS server to the determined load balancing server. Furthermore, the references do not disclose or suggest that the load balancing server responds to each request by determining at least one of the content servers that has the characteristics relative to the location, as recited in claim 26.

For at least the above-identified reasons, Applicant respectfully submits that claim 26 is patentable over the He reference and Zisapel, alone or in combination, and is allowable. Given that claim 27 depend from claim 26, claim 27 is also allowable for as least these reasons.

Claim rejections under 35 U.S.C. 103 (a) - He, Zisapel, and Mangipudi

Claims 21-22 stand rejected under 35 U.S.C. 103(a) as being unpatentable by the He reference in view of Zisapel and further in view of Mangipudi et al. (U. S. Patent Application Pub. No. US 2004/0162901) (hereinafter "Manigipudi").

Claims 21 and 22 recite:

> 21. A method of performing client-centric load balancing of multiple globally-dispersed servers, the servers being accessed by clients connecting through Internet service providers (ISPs) at a point of presence (POP), each ISP having a load balancing domain name server (DNS-ISP-LB), the servers further having an authoritative domain name server (DNS-A) associated therewith containing information regarding the IP addresses of the servers, the method comprising the steps of:
>
> deploying a first plurality of measurement service agents (MServices) in close physical proximity to the ISP POPs;
>
> monitoring, by the MServices at a location physically proximate to the ISP POP, performance of the servers; and
>
> providing, by the DNS-ISP-LB in response to a query from the client, the IP address of a server based on the step of monitoring.
>
> 22. A method of performing client-centric load balancing of multiple globally-dispersed servers, the servers being accessed by clients connecting through Internet service providers (ISPs) at a point of presence (POP), each ISP having a load balancing domain name server (DNS-ISP-LB), the servers further having an authoritative domain name server (DNS-A) associated therewith

containing information regarding the IP addresses of the servers, the method comprising the steps of:

deploying a first plurality of measurement service agents (MServices) in close physical proximity to the ISP POPs;

monitoring, by the MServices at a location physically proximate to the ISP POP, performance of the servers; and

providing, by the DNS-ISP-LB in response to a query from the client, an IP address of the MService.

As described above, the He reference describes a system for wide area network load balancing that includes a load balancing server (LBS) selector for selecting a server to balance tasks among multiple servers. However, nothing in the He reference discloses or suggests that the LBS selector takes physical proximity into account. Zisapel describes a triangulation load balancing system that includes load-balancing domain name servers that are located near the content servers, instead of the clients. However, as acknowledged by the Office Action, neither of the references discloses or suggests the steps of "deploying a first plurality of measurement service agents (MServices) in close physical proximity to the ISP POPs" or "monitoring, by the MServices at a location physically proximate to the ISP POP, performance of the servers", as recited in claims 21 and 22. (See Office Action, paragraph 5a). Mangipudi does not cure these inadequacies.

Mangipudi describes a system for policy based class service and adaptive server level management. The system in Mangipudi includes a monitoring processor adaptive policy engine that is in communication with a router of a network and agents on back-end servers. However, neither the monitoring processor adaptive policy engine nor the agents are in close physical proximity to ISP POPs or are configured to monitor the servers at a location physically proximate to an ISP POP. Thus, the monitoring processor

adaptive policy engine and the agents described in Mangipudi are not equivalent to the measurement service agents, as recited in claims 21 and 22.

For at least the above-identified reasons, Applicant respectfully submits that claims 21 and 22 are patentable over the He reference, Zisapel and Mangipudi, alone or in combination, and are allowable.

CONCLUSION

Accordingly, in view of the above amendment and remarks it is submitted that the claims are patentably distinct over the cited references and that all the rejections to the claims have been overcome. Reconsideration of the above Application is requested. Based on the foregoing, Applicants respectfully requests that the pending claims be allowed, and that a timely Notice of Allowance be issued in this case. If the Examiner believes, after this response, that the application is not in condition for allowance, the Examiner is requested to call the Applicant's attorney at the telephone number listed below.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee occasioned by this response, including an extension fee that is not covered by the enclosed fee transmittal, please charge any deficiency to Deposit Account No. 50-0463.

Respectfully submitted,

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August 31, 2005
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Thomas Wong
Type or Print Name

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